UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/650,461	08/27/2003	David Dawes	9140.0025-00	7106

22852 7590 10/10/2007

FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER LLP
901 NEW YORK AVENUE, NW
WASHINGTON, DC 20001-4413

EXAMINER	
DUPUIS, DEREK L	

ART UNIT	PAPER NUMBER
2883	

MAIL DATE	DELIVERY MODE
10/10/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/650,461	DAWES, DAVID	
	Examiner	Art Unit	
	Derek L. Dupuis	2883	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 July 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 3-25* is/are pending in the application.

4a) Of the above claim(s) *15-20* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-14 and 21-23* is/are rejected.

7)☒ Claim(s) *24,25* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 July 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *7/9/2007*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments with respect to claims 1 and 3-14 have been considered but are moot in view of the new ground(s) of rejection.

Information Disclosure Statement

The information disclosure statement (IDS) submitted on 7/9/2007 was filed after the mailing date of the non-final rejection on 3/6/2007. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Product By Process Claims

Claims 21-25 are **product-by-process claims**:

> Note that a "product by process" claim is directed to the product per se, no matter how actually made, *In re Hirao*, 190 USPQ 15 at 17 (footnote 3). See also *In re Thorpe*, 227 USPQ 964, 966; *In re Luck*, 177 USPQ 523; *In re Fessmann*, 180 USPQ 324; *In re Avery*, 186 USPQ 161; *In re Wertheim*, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); and *In re Marosi* et al., 218 USPQ 289, all of which make it clear that it is the patentability of the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in " product by process" claims or not. Note that applicant has the burden of proof in such cases, as the above case law makes clear. See also MPEP 2113.

Claims 21-25 do not distinguish over the prior art of record regardless of the process used to create the slab waveguide, because only the final product is relevant, and not the process of making such as DC-biased plasma vapor deposition.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 21-23 are rejected under 35 U.S.C. 102(e) as being anticipated by ***Zhou et al (US 2003/0044118 A1)***.

3. Zhou et al teach an optical waveguide shown best in figure 13. The amorphous film based slab waveguide has a refractive index contrast of .38%. This is greater than the claimed range of 0.2%. Zhou et al teach that the core (1345) has a refractive index of 3.5 and the cladding (1350) has a refractive index of 1.7 (see paragraph 187-188). The core is disposed on a buffer layer (1310) which is disposed on a substrate (1315). As shown in figures 2-6, Zhou et al discloses that the waveguide can be coupled to a laser diode to transmit light emitted by the diode. Zhou et al teaches that the semiconductor laser device can be integrated onto the same substrate as the waveguide (see paragraph 221). The waveguide has a thickness sufficient to couple the light from the laser diode as shown in figures 2-6. Zhou et al teach that the waveguide could have an irregular shape which meets the limitation of having an amorphous structure. The American Heritage Dictionary defines the term "amorphous" to mean "lacking organization, formless". Irregular shapes would meet this definition. Claims 21-23 do not distinguish over the prior art of record regardless of the process used to create the slab waveguide, because only the final product is relevant, and not the process of making such as DC-biased plasma vapor deposition.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1, 7, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over ***Zhou et al (US 2003/0044118 A1)***.

6. Zhou et al teach an optical waveguide shown best in figure 13. The amorphous film based slab waveguide has a refractive index contrast of .38%. This is greater than the claimed range of 0.2%. Zhou et al teach that the core (1345) has a refractive index of 3.5 and the cladding (1350) has a refractive index of 1.7 (see paragraph 187-188). The core is disposed on a buffer layer (1310) which is disposed on a substrate (1315). As shown in figures 2-6, Zhou et al discloses that the waveguide can be coupled to a laser diode to transmit light emitted by the diode. The waveguide has a thickness sufficient to couple the light from the laser diode as shown in figures 2-6. Zhou et al teach that the waveguide could have an irregular shape which meets the limitation of having an amorphous structure. The American Heritage Dictionary defines the term "amorphous" to mean "lacking organization, formless". Irregular shapes would meet this definition.

7. Zhou et al teach that the waveguide can be formed on the same substrate as a semiconductor photonic device (see paragraph 221). Photodiodes are notoriously well known, and routinely used semiconductor photonic devices and it would be obvious to one of ordinary skill in the art to use a photodiode with an optical waveguide to detect and process an optical signal.

8. Claims 3 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over ***Zhou et al (US 2003/0044118 A1)*** as applied to claims 1, 7, and 9 above, and further in view of ***Hubner et al ("Planar Er- and Yb- Doped Amplifiers and Lasers").***

9. Zhou et al teach an optical waveguide device as discussed above in reference to claim 7. Zhou et al do not teach that the slab waveguide is folded in the plane of the slab. Hubner et al teach an optical waveguide device shown in figure 2a with a slab waveguide that is folded in the plane of the slab. Hubner et al also teach that the curled waveguide has a loss of 2.5 dB over 67 cm which comes out to about 0.037 dB/cm which is far less than 0.3 dB/cm. It would have been obvious to one of ordinary skill in the art at the time of invention to modify the slab waveguide taught by Zhou et al by folding it as taught by Hubner for the purpose of increasing the amplification of the waveguide. The longer the waveguide, the greater the gain. Hubner teaches that by "curling" the waveguide within an area, then a longer waveguide can be used thereby increasing the amplification of the device (see the bottom paragraph of page 72).

10. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over ***Zhou et al (US 2003/0044118 A1)*** as applied to claims 1, 7, and 9 above, and further in view of ***Kaneko et al (US 6,088,492).***

11. Zhou et al teach an optical waveguide as discussed above in reference to claim 1. Zhou et al do not explicitly state that the waveguide is smooth. Kaneko et al teach a smooth optical waveguide that is coupled to a laser diode. It would have been obvious to one of ordinary skill in the art to make the waveguide of Zhou et al smooth as taught by Kaneko et al. Motivation to do this would be that "a smooth film surface of an optical waveguide....is preferable for achieving a low propagation loss." See column 3, lines 15-35 of Kaneko et al.

12. Claims 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over ***Zhou et al (US 2003/0044118 A1)*** as applied to claims 1, 7, and 9 above, and further in view of ***Beach ("Theory and optimization of lens ducts").***

13. Zhou et al teach an optical waveguide device as discussed above in reference to claim 1. Zhou et al do not teach that the slab waveguide includes a lens duct. Beach teaches a waveguide device with a lens duct to couple light from a diode into a waveguide. It would have been obvious to one of ordinary skill in the art at the time of invention to use a lens duct as taught by Beach in the waveguide device as taught by Zhou et al for the purpose of "amplifying the irradiance of laser diode sources" (see abstract of Beach).

14. Claims 6, 10, 12, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over ***Zhou et al (US 2003/0044118 A1)*** as applied to claims 1, 7, and 9 above, and further in view of ***Medin et al (US 6,760,520 B1).***

15. Zhou et al teach an optical waveguide device as discussed above in reference to claim 1. Zhou et al do not teach that the waveguide includes a mode-size converter or a reverse tapered region. However, Medin et al teach a mode size converter with a reverse tapered region for use in an optical waveguide device. Medin et al also teach that the mode size converter can be used in an array with an array of laser diodes and waveguides (see column 10, line 53 to column 11, line 14). It would have been obvious to one of ordinary skill in the art at the time of invention to use the mode-size converter taught by Medin et al in the optical waveguide device of Zhou et al for the purpose of improving optical coupling between a waveguide and a light emitting device (see abstract).

16. Claims 11 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over ***Zhou et al (US 2003/0044118 A1)*** as applied to claims 1, 7, and 9 above, and further in view of ***Henrichs (US 2003/0185266 A1).***

17. Zhou et al teach an optical waveguide device as discussed above in reference to claim 1. Zhou et al also teach that the mode size of an optical beam transmitted through the waveguide slab is smaller than the mode size of an incident light beam (see paragraphs 8-10). The field of the optical mode decreases though the waveguide. Zhou et al do not teach that the diode could be a VCSEL. However, Henrichs shows that a VCSEL and a diode are equivalent structures known in the art and that they are both used in optical pumping. It would have been obvious to one of ordinary skill in the art at the time of invention to substitute a VCSEL for a laser emitting diode as a light source.

Allowable Subject Matter

18. Claims 24 and 25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

19. The following is a statement of reasons for the indication of allowable subject matter:

20. Claim 24 is allowable over the prior art of record because the latter, either alone or in combination, does not disclose nor render obvious an optical waveguide device comprising at least one laser diode formed on a substrate and at least one amorphous film-based, biased pulsed DC plasma vapor-deposited slab waveguide having a refractive index contrast of at least 0.2% formed on the substrate, coupled to receive light from the at least one laser diode, wherein the

core is formed form rare-earth doped Al_2O_3, Y_2O_3, or TiO_2, and the cladding is formed from Al_2O_3, or Y_2O_3 in combination with the rest of the claimed limitations.

21. Claim 25 is allowable over the prior art of record because the latter, either alone or in combination, does not disclose nor render obvious an optical waveguide device comprising at least one laser diode formed on a substrate and at least one amorphous film-based, biased pulsed DC plasma vapor-deposited slab waveguide having a refractive index contrast of at least 0.2% formed on the substrate, coupled to receive light from the at least one laser diode, wherein the core comprises a single-mode core and the cladding comprises a multi-mode cladding in combination with the rest of the claimed limitations.

Conclusion

22. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

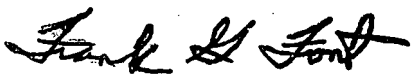
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Derek L. Dupuis whose telephone number is (571) 272-3101. The examiner can normally be reached on Monday - Thursday 8:30am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Derek L. Dupuis
Group Art Unit 2883



Frank G. Font
Supervisory Patent Examiner
Technology Center 2800